

BRFSS 2012–2014: Demographic and Employment Characteristics of Cell Phone Only Respondents

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Executive Summary

The growing proportion of American homes without landlines, using only cell phones¹ (cell only) led us to explore characteristics of the working population based on household phone usage collected in response to the Washington Behavioral Risk Factor Surveillance System (WA BRFSS), a phone-based public health survey.

Key observations include:

- During 2012–2014, 17.2% of respondents to the WA BRFSS were cell only (i.e., no landline).
- A greater proportion (23.2%) of the working respondents were cell only compared to those not working (11.0%).
- Among working respondents, those who were cell only were more likely to be:
 - Younger, male, and lower income.
 - Unmarried and without children.
 - Less educated. However, when controlling for age, sex, and income, those with high education attainment were more likely to be cell only.
 - Black/African American, Native Hawaiian/Other Pacific Islander, and multiracial respondents, when compared to white respondents.
 - Self-employed rather than employed for wages.
- By industry of employment, the proportion of respondents that were cell only ranged from 14.1% in Educational Services to 37.7% in Accommodation and Food Services.
- By occupation, the proportion of respondents that were cell only ranged from 15.6% in Management, Business, and Financial Occupations to 28.4% in Transportation, Material Moving, Construction, and Extraction occupations.

Introduction:

The National Health Interview Survey found that in 2015 nearly 50 percent of American homes were cell phone only¹. Many sources indicate that this trend will continue and will impact public health surveys conducted by telephone. The Washington Behavioral Risk Factor Surveillance System survey (WA BRFSS) is a telephone survey conducted annually and has been steadily increasing the number of cell phone survey participants over time. This report examines demographic characteristics of WA BRFSS respondents with and without a landline (cell only) to better understand the implications of this survey methodology over time.

Methods:

For this analysis, the population of interest were Washington State respondents to the 2012 - 2014 Behavioral Risk Factor Surveillance System survey (BRFSS) who were employed at some time in the last 12 months. The BRFSS is a CDC-sponsored, statewide annual telephone survey collecting information on health outcomes and behaviors. The sample includes adults 18 years of age and older in a private residence or college housing. We defined the working population as participants who are employed for wages, self-employed, or out of work for less than 1 year. All other respondents were considered 'non-working' (out of work 1+ year, homemaker, student, retired, or unable to work). Working respondents with a cell phone that indicated they had no landline (cell only) were compared to all other working respondents that owned a landline telephone. Sample frequencies and percentages are presented, as well as crude and adjusted odd ratios calculated from logistic regression modeling to examine the distribution of cell only respondents across demographic characteristics. All tests were performed with a statistical significance level $\alpha = 0.05$ using SAS version 9.4.

Results:

For the period from 2012 – 2014, the WA BRFSS had 36,566 respondents. The percent that were cell phone only ranged from 13.8% in 2012 to 20.3% in 2013, see Table 1. More working respondents, as defined above, were cell only compared to those not working (23.2% vs 11.0%, respectively).

Table 1. Cell only vs. landline respondents by year and employment status, WA BRFSS, 2012–2014

	Sample no.	Percent cell only^a	Percent landline^b
Year			
2012	15,312	13.8	86.2
2013	11,162	20.3	79.7
2014	10,092	18.9	81.1
Total	36,566	17.2	82.8
Employment status			
Working ^d	18,472	23.2	76.7
Non-working ^c	18,094	11.0	89.0

^a Cell only: cell phone respondents with no landline

^b Landline: landline respondents and cellphone respondents with a landline

^c Non-working: out of work 1+ year, homemaker, student, retired, unable to work

^d Working: employed for wages, self-employed, out of work <1 year

Among working respondents, those that were cell only tended to be of younger age, male, lower income, not currently married, and without children, see Table 2. A greater portion of those with less education were cell only. However, when controlling for age, sex, and income, those with high education attainment were more likely to be cell only. Compared to white respondents, black/African American, Native Hawaiian/Other Pacific Islander, and multiracial respondents were also more likely to be cell only.

Distribution of cell only respondents by employment characteristics are detailed in Table 3. Cell only respondents were more likely to be employed for wages than self-employed. The smallest proportion of cell only respondents by industry was observed among those working in the Educational Services (14.1%), and the highest among those working in Accommodation and Food Services (37.7%). When adjusting for age, sex, and income, respondents working in the following industries were significantly less likely to be cell only when compared to respondents working in the Information, Finance and Insurance, Real Estate Services, and Management industry: Agriculture, Forestry, Fishing, Hunting, Mining; Public Administration; Wholesale and Retail Trade; Manufacturing; and Health Care and Social Assistance.

Table 2. Distribution of cell only respondents by demographics, working adults^a only, WA BRFSS, 2012-2014

		Sample no.	Percent cell only ^b	Crude OR ^c (95% CI)	Adjusted ^d OR (95% CI)
Age	TOTAL working adults	18,472	23.2	--	--
	ages 18-25	1,346	60.2	22.3 (17.6, 28.2)*	--
	ages 26-35	2,580	54.2	17.4 (14.0, 21.8)*	--
	ages 36-45	3,413	24.5	4.8 (3.8, 6.0)*	--
	ages 46-55	4,803	13.9	2.4 (1.9, 3.0)*	--
	ages 56-65	4,640	9.7	1.6 (1.3, 2.0)*	--
	ages 66+ (ref)	1,478	6.4	--	--
Sex	Male	9,022	27.5	1.6 (1.5, 1.7)*	--
	Female (ref)	9,450	19.2	--	--
Income	Less than \$15,000	1,390	36.3	2.9 (2.5, 3.3)*	--
	\$15,000 to less than \$25,000	985	38.3	3.1 (2.7, 3.6)*	--
	\$25,000 to less than \$35,000	1,422	33.2	2.5 (2.2, 2.8)*	--
	\$35,000 to less than \$50,000	2,264	26.9	1.9 (1.7, 2.1)*	--
	\$50,000 to less than \$75,000	3,193	22.1	1.4 (1.3, 1.6)*	--
	\$75,000 or more (ref)	7,598	16.6	--	--
Marital Status	Married (ref)	10,952	17.1	--	--
	Divorced	2,553	22.3	1.4 (1.3, 1.6)*	1.9 (1.7, 2.1)*
	Widowed	633	10.0	0.5 (0.4, 0.7)*	1.2 (0.9, 1.7)
	Separated	364	35.4	2.7 (2.1, 3.3)*	2.0 (1.6, 2.6)*
	Never Married	3,070	42.6	3.6 (3.3, 3.9)*	1.4 (1.3, 1.6)*
	A member of an unmarried couple	775	39.1	3.1 (2.7, 3.6)*	1.8 (1.5, 2.2)*
Children	Yes (ref)	6,578	23.7	--	--
	No	11,828	23.1	1.0 (0.9, 1.0)	1.7 (1.5, 1.8)*
Education	Less than high school (ref)	757	32.8	--	--
	High school graduate	3,505	26.5	0.7 (0.6, 0.9)*	1.0 (0.8, 1.2)
	College 1-3 years	5,295	24.0	0.6 (0.5, 0.8)*	1.2 (1.0, 1.4)
	College 4+ years	8,887	20.8	0.5 (0.5, 0.6)*	1.3 (1.1, 1.6)*
Race/Ethnicity	White (ref)	15,133	20.6	--	--
	Black or African American	337	40.1	2.6 (2.1, 3.2)*	1.6 (1.2, 2.0)*
	Asian	371	28.3	1.5 (1.2, 1.9)*	1.0 (0.8, 1.3)
	Native Hawaiian/ Other Pacific Islander	427	39.1	2.5 (2.0, 3.0)*	1.6 (1.3, 2.1)*
	American Indian/Alaskan Native	129	29.5	1.6 (1.1, 2.4)*	0.9 (0.6, 1.5)
	Other	196	33.7	2.0 (1.5, 2.6)*	1.4 (1.0, 2.0)
	Multiracial	377	37.4	2.3 (1.9, 2.8)*	1.4 (1.1, 1.8)*
	Hispanic	1,262	36.8	2.2 (2.0, 2.5)*	1.0 (0.9, 1.2)

^a Working: employed for wages, self-employed, out of work <1 year

^b Cell only: cell phone respondents with no landline

^c Odds of cell only vs landline

^d Adjusted for age, sex, and income

Table 3. Distribution of cell only respondents by employment characteristics, working adults^a only, WA BRFSS, 2012-2014

	Sample no.	Percent cell only ^a	Crude OR ^c (95% CI)	Adjusted ^d OR (95% CI)
Employment Status	TOTAL working adults	18,472	23.2	--
	Employed for wages (ref)	14,614	24.3	--
	Self-Employed	2,845	15.0	0.6 (0.5, 0.6)*
	Out of work for less than 1 year	1,013	31.1	1.4 (1.2, 1.6)*
Industry				
	Agriculture, Forestry, Fishing, Hunting, Mining	699	16.9	0.8 (0.6, 1.0)*
	Construction	1,034	26.0	1.4 (1.1, 1.6)*
	Manufacturing	1,644	20.6	1.0 (0.8, 1.2)
	Wholesale and Retail Trade	1,638	23.0	1.2 (1.0, 1.4)
	Transportation and Warehousing	675	26.5	1.4 (1.1, 1.7)*
	Utilities	219	17.4	0.8 (0.6, 1.2)
	Professional, Scientific, and Technical Services	1,676	23.5	1.2 (1.0, 1.4)
	Administrative Support and Waste Mgmt Services	487	28.3	1.5 (1.2, 1.9)*
	Educational Services	1,990	14.1	0.6 (0.5, 0.8)*
	Health Care and Social Assistance	2,734	18.6	0.9 (0.8, 1.0)
	Arts, Entertainment, and Recreation	379	25.3	1.3 (1.0, 1.7)*
	Accommodation and Food Services	554	37.7	2.3 (1.9, 2.9)*
	Other Services	858	20.0	1.0 (0.8, 1.2)
	Public Administration	1,244	14.2	0.6 (0.5, 0.8)*
	Information, Finance & Insurance, Real Estate Services, and Mgmt (ref)	1,489	20.6	--
Occupation				
	Management, Business and Financial	3,521	15.6	0.6 (0.5, 0.7)*
	Professional and Related	5,385	18.5	0.7 (0.6, 0.9)*
	Service	2,187	25.8	1.1 (0.9, 1.3)
	Sales and Related	1,331	23.4	1.0 (0.8, 1.2)
	Office and Administrative Support	1,825	20.2	0.8 (0.6, 1.0)*
	Farming, Fishing, and Forestry	260	26.5	1.1 (0.8, 1.6)
	Construction and Extraction	642	28.4	1.2 (1.0, 1.6)
	Installation, Repair, and Maintenance	423	25.3	1.1 (0.8, 1.4)
	Transportation and Material Moving	765	28.4	1.2 (1.0, 1.6)
	Production (ref)	662	24.2	--

^a Working: employed for wages, self-employed, out of work <1 year

^b Cell only: cell phone respondents with no landline

^c Odds of cell only vs landline

^d Adjusted for age, sex, and income

The smallest proportion of cell only respondents by occupation was observed among those working in the Management, Business, and Financial occupations (15.6%), and the highest among those in Transportation, Material Moving (28.4%), Construction, and Extraction occupations, but no significant differences adjusting for age, sex, and income.

Discussion

There are markedly different demographic, socioeconomic, and employment characteristics of BRFSS survey respondents when comparing cell phone only to landline telephone respondents. These differences strongly support telephone survey methods to include robust cell phone sampling.

From NHIS data there is recognition that younger male Americans with less education who are living in household poverty are more likely to be in cell only households.¹ Our data from BRFSS respondents supports these observations among employed respondents. We are not able to estimate the number of cell only households in Washington using the BRFSS due to sampling methodology, however we are able to describe and identify demographic differences among survey respondents by telephone type. We are unaware of data specifying the employment characteristics of cell phone only respondents in public health surveys like NHIS or BRFSS and thus this study presents new information.

Factors such as age, sex, and income are correlated with the type of work one does. We expected that adjusting for age, sex, and income would diminish the observed variation across industry and occupation in cell phone only respondents. For example, the unadjusted data suggests that those workers in Accommodation and Food Services have more than twice the odds of being cell phone only respondents compared to those workers in the Information, Finance, Insurance, Real Estate Services, and Management Industries. Following adjustment for age, sex, and income, the odds of having cell phone only household does not appear to be elevated for Accommodation and Food Services workers. Nevertheless, public health interventions should consider the marked differences in cell phone only households by industry; the range of observations for the prevalence of cell phone only respondents are 14.1% in Educational Services to 37.7% in Accommodation and Food Services.

While we can't infer too much about cell phone only respondents access to the internet, our findings likely support placement of prevention information on mobile platforms. Our observation of the high prevalence of cell phone only BRFSS respondents in lower income employed respondents coupled with US Census data reporting the absence of home internet/computer availability in lower income households² infer the use of cell phones as a means to access the internet and prevention information.

References:

- (1) Blumberg SJ, Luke JV. Wireless substitution: Early release of estimates from the National Health Interview Survey, January – June 2015. National Center for Health Statistics. December 2015. Available from: <http://www.cdc.gov/nchs/nhis/index.htm>. Accessed August 12, 2016.
- (2) File, Thom. 2013. "Computer and Internet Use in the United States." Current Population Survey Reports, P20-568. U.S. Census Bureau, Washington, DC.
- (3) Leigh JP, DeVogli R. Low wages as occupational health hazards. JOEM 2016: 58(5): 444-447.